

# Genetic Diversity of Dolly Varden Populations in Norton and Kotzebue Sounds

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## Abstract

We describe the genetic stock structure of Dolly Varden *Salvelinus malma* in Norton and Kotzebue Sounds to develop a method to quantify contributions of Dolly Varden stocks harvested in subsistence fisheries in the Wulik River. We surveyed genetic variation at seven micro satellite loci in 12 population samples from Norton and Kotzebue sounds and four additional populations from the North Slope and the Togiak River. Significant differences in allele frequencies were detected among all pair wise combinations of populations and evidence of a closer genetic similarity was detected between Dolly Varden in the Imuruk Basin and Norton Sound, despite the size distribution and life history similarities Imuruk Basin Dolly Varden share with Kotzebue Sound Dolly Varden. Mean contribution estimates from analysis of simulated mixtures from individual tributaries ranged from 82% to 98%, suggesting that robust stock composition estimates for regional groups, and in some cases, individual tributaries can be obtained. Dolly Varden were sampled from the Wulik River subsistence fishery in October 2001. Two hundred individuals were randomly selected from the fishery samples with size information and Bayesian Markov chain Monte Carlo estimates of regional stock proportions were made: North Slope 0.0369 (SD 0.0357), Kotzebue Sound 0.6726 (SD 0.0597), Cobblestone River 0.0035 (SD 0.0097), Norton Sound 0.2785 (SD 0.0571), and Togiak River 0.0085 (SD 0.015). The majority of Dolly Varden used in the mixture analysis was less than 325mm FL, suggesting that at least some Dolly Varden are migrating into the Chukchi Sea basin during their first or second seaward migrations.

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